Change 1, June 3, 1971

KSC LOD NO. 6B
Date: March 9, 1971

(Replaces LOD NO. 6A, dated January 5, 1968)

KSC LAUNCH OPERATIONS DIRECTIVE NO. 6B

To: Distribution

From: for Walter J. Kapryan
Director of Launch Operations

Subject: PREPARATION AND MANAGEMENT OF TEST AND CHECKOUT PROCEDURES (TCP's) FOR OMSF PROGRAMS

1.1 PURPOSE

The purpose of this directive is to establish the instructions necessary for the preparation and management of Test and Checkout Procedures (TCP's) by responsible organizations within the Directorate of Launch Operations for OMSF Programs.

2.1 AUTHORITY

2.1.1 The authority for this directive is established by the following:

a. OMSF Apollo Program Directive No. 26B (M-D MA 1400.075), dated December 6, 1967, entitled "Preparation of Test and Checkout Plans and Procedures at KSC."

b. OMSF Apollo Applications Program Directive No. 26 (M-D ML 3200.115), dated October 10, 1969, entitled "Intercenter Responsibilities for Support and Preparation of KSC Test and Checkout Plans and Procedures."

c. KSC Apollo Program Directive No. 11, dated June 2, 1967, entitled "Preparation and Management of Kennedy Space Center Test and Checkout Plans and Procedures."

d. KMI 1710.1B, dated October 9, 1970, entitled "The Safety Program."

e. KMI 1710.13A, dated May 25, 1970, entitled "Safety Review of KSC Technical Operating Procedures."

f. KMI , entitled "Procedure Numbering Instructions for Apollo/Saturn and Skylab Related Operations at KSC."

g. KMI 8610.9/AA, dated January 18, 1971, entitled "Technical Operating and Maintenance Procedure Policy.

2.1.2 OMSF Program Directive APD No. 26B and AAPD No. 26 describe the general framework within which KSC is responsible for the establishment of the Test and Checkout Plan for the integration of all test activities at the launch site and the detailed Test and Checkout Procedures (TCP's) to be utilized in the performance of each specific test or operation. In response to the above program directives, three (3) KSC Launch Operations Directives (LOD's) have been formulated to establish the following management systems:

a. LOD No. 5A entitled "Preparation and Management of Launch Operations Test and Checkout Plan."

b. LOD No. 6B entitled "Preparation and Management of Test and Checkout Procedures (TCP's) for OMSF Programs."

c. LOD No. 7A entitled "Test Briefings and De-Briefings."

3.1 APPLICABILITY

The policy established by this directive is effective for OMSF Programs.

4.1 SCOPE

The provisions of this directive are applicable to all organizational elements, within the Directorate of Launch Operations, that are responsible for the preparation and management of TCP's to be utilized during the preparation and launch of OMSF space vehicles.

5.1 DEFINITIONS

5.1.1 TEST AND CHECKOUT PROCEDURES (TCP's)

A Test and Checkout Procedure (TCP) defines the detailed step-by-step sequence of events in the performance of a specific test or operation. The necessary launch vehicle (L/V), spacecraft (S/C), and/or space vehicle (S/V) TCP's will be prepared for each test or operation identified in the Test and Checkout Plan (TCOP).

In addition, TCP's (or equivalent documents) will be prepared for all other operations including tests, maintenance, repair, assembly and modification of flight hardware, ground support equipment and facilities not specifically identified by the TCOP when the operation is detailed or complicated and there is reasonable doubt that it can be performed correctly without written instructions.

5.1.2 OPERATIONS INTERFACE CONTROL CHART

An Operations Interface Control Chart is a T-time oriented bar chart which identifies the periods in which activities are scheduled to occur within the TCP. It will provide operational configuration control of those activities which are interrelated between elements of the Directorate of Launch Operations and external support organizations.

5.1.3 SPACE VEHICLE (S/V) TCP

A space vehicle (S/V) TCP is designed to meet the following specified requirements relative to interrelated tests and operations between elements of the Directorate of Launch Operations and external support organizations:

a. To serve as the primary working document of the Test Supervisor, Launch Operations Manager, and other key management personnel charged with the overall direction of the test or operation.

b. To serve as the official document for KSC and ETR support scheduling, with sufficient information to provide support need-times for call-up and utilization of items listed in the appropriate KSC Support Directives (SD's) and ETR Operations Directives (OD's).

c. To serve as the primary procedure for external operations which interface with the Test Supervisor, such as the ETR Superintendent of Range Operations (SRO), the KSC Test Support Controller, the MILA Unified S-Band (USB) Station, and the MCC Flight Director.

5.1.4 TCP CHANGE

A TCP change is prepared and processed in order to implement a procedural change after the release of an approved TCP. TCP changes consist of the following two (2) types:

a. TCP Revision

A TCP revision is a procedural change that results in a new document or page substitution to the applicable TCP. This system of TCP changes is utilized as long as the response

cycle through reproduction permits distribution to test team members not later than forty-eight (48) hours prior to the scheduled start of a test or operation.

b. TCP Deviation

A TCP deviation is a real time procedural change that is required when insufficient time remains to process a TCP revision prior to the scheduled start of a test or operation, or is required during the performance of a test or operation.

5.1.5 PROCEDURE CHANGE REQUEST (PCR)

A Procedure Change Request (PCR) is a standard KSC Form (KSC Form 23-257) utilized to accomplish the requesting, approving, and processing of TCP revisions as well as TCP deviations occurring prior to the start of a test or operation.

5.1.6 HAZARDOUS OPERATION

A hazardous operation is any operation or sequence which could result in damage to property or injury to personnel, as defined in Section 11 of Attachment A to KMI 1710.1B.

6.1 RESPONSIBILITIES

6.1.1 GENERAL

6.1.1.1 The Director of Launch Operations is responsible for the overall preparation and management of launch site TCP's.

6.1.1.2 The Director, Launch Vehicle Operations; the Director, Spacecraft Operations; the Test Planning Manager; and the Test Operations Manager are responsible for insuring compliance with the provisions of this directive within their respective organizations.

6.1.2 SPECIFIC

6.1.2.1 Director, Launch Vehicle Operations

The Director, Launch Vehicle Operations is responsible for the following functions:

a. Preparation of appropriate instructions for the Directorate of Launch Operations and associated contractors delineating responsibilities and interfaces in the preparation and management of L/V TCP's.

b. Final determination that all L/V TCP's have been reviewed by appropriate elements for technical correctness and adequacy, and are in accordance with the appropriate Test and Checkout Requirements, Test and Checkout Specifications and Criteria, Test and Checkout Plan, Launch Mission Rules, and/or launch vehicle operations safety criteria.

c. Securing the approval of the appropriate development center through channels for all variances from the appropriate Test and Checkout Requirements, Test and Checkout Specifications and Criteria, and inputs to the Launch Mission Rules.

d. Submission of all L/V TCP's and revisions thereto to the KSC Safety Office for review and signature approval prior to publication. All TCP deviations that could introduce hazardous operations into the test or operation will be approved by the KSC Safety Office.

e. For L/V TCP's to be performed involving the Eastern Test Range (ETR) Digital Range Safety Command System (DRSCS), verifying, through the KSC Safety Office, that all TCP's have been submitted to the ETR Safety organization and that the submitted TCP's have ETR Safety approval prior to the performance of the test or operation.

f. Release of approved L/V TCP's to appropriate NASA and contractor personnel not later than thirty (30) calendar days prior to the scheduled date of the test or operation.

g. Input, coordinate, and concur in the development of S/V Operations Interface Control Charts (OICC's). An approved S/V OICC will be the TCP sequence control document for that test or operation. Revision of the S/V OICC may occur as required, but only with the concurrence of all organizations validating the approved chart. The Test Planning Manager will approve and process S/V OICC's.

h. Assurance of complete technical and idiomatic compatibility of L/V TCP's with appropriate S/C, S/V, and Support TCP's that are utilized in the performance of S/V tests or operations. Appropriate inputs from the Test Operations Office and the Test Planning Office will be incorporated into these L/V TCP's. Sequences common to more than one TCP will be identified as interfacing sequences and will not be changed without concurrence of both organizations.

i. Establish and identify L/V NASA and contractor personnel who will coordinate the detailed L/V TCP preparation with appropriate Spacecraft, Space Vehicle, and Technical Support personnel.

6.1.2.2 Director, Spacecraft Operations

The Director, Spacecraft Operations is responsible for the following functions:

a. Preparation of appropriate instructions for the Directorate of Spacecraft Operations and associated contractors delineating responsibilities and interfaces in the preparation and management of S/C TCP's.

b. Final determination that all S/C TCP's have been reviewed by appropriate elements for technical correctness and adequacy, and are in accordance with the appropriate Test and Checkout Requirements, Test and Checkout Specifications and Criteria, Flight Crew Procedures, Test and Checkout Plan, Launch Mission Rules, and/or spacecraft operations safety criteria.

c. Securing the approval of the appropriate development center through channels for all variances from the appropriate Test and Checkout Requirements, Test and Checkout Specifications and Criteria, Flight Crew Procedures, and inputs to the Launch Mission Rules.

d. Utilization of Flight Crew Procedures, as approved and published by MSC, in the preparation of S/C TCP's for all tests involving flight crew participation. In all cases where incompatibility exists between Flight Crew Procedures and S/C TCP's, the areas of incompatibility will be promptly

identified to the MSC Spacecraft Program Resident Manager. Resident Manager's signature approval will be obtained on all S/C TCP's and revisions thereto for tests involving flight crew participation.

e. Submission of all S/C TCP's and revisions thereto to the KSC Safety Office for review and signature approval prior to publication. All TCP deviations that could introduce hazardous operations into the test or operation will be approved by the KSC Safety Office.

f. Release of approved S/C TCP's to appropriate NASA and contractor personnel not later than thirty (30) calendar days prior to the scheduled date of the test or operation.

g. Input, coordinate, and concur in the development of S/V Operations Interface Control Charts (OICC's). An approved S/V OICC will be the TCP sequence control document for that test or operation. Revision of the S/V OICC's may occur as required, but only with the concurrence of all organizations validating the approved chart. The test Planning Manager will approve and process S/V Test OICC's.

h. Assurance of complete technical and idiomatic compatibility of S/C TCP's with appropriate L/V, S/V, and Support TCP's that are utilized in the performance of the S/V tests or operations. Appropriate inputs from the Test Operations Office and the Test Planning Office will be incorporated into these S/C TCP's. Sequences common to more than one TCP will be identified as interfacing sequences and will not be changed without concurrence of both organizations.

i. Establish and identify S/C NASA and contractor personnel who will coordinate the detailed S/C TCP preparation with appropriate Launch Vehicle, Space Vehicle, and Technical Support personnel.

6.1.2.3 Test Planning Manager

The Test Planning Manager is responsible for the following functions:

a. Preparation of appropriate instructions for the Test Planning Office and associated contractors delineating responsibilities and interfaces in the preparation and management of S/V TCP's.

b. Preparation, management and approval of S/V OICC's. Approval of revisions to OICC's only with the concurrence of all organizations involved thus assuring compatibility of revisions, Process and distribute OICC's.

c. Preparation and management of S/V TCP's and changes thereto for S/V tests or operations.

d. Submission of all S/V TCP's and revisions thereto to the KSC Safety Office for review and signature approval prior to publication. All TCP deviations that could introduce hazardous operations into the test or operation will be approved by the KSC Safety Office.

e. For S/V TCP's to be performed involving the ETR DRSCS, verifying, through the KSC Safety Office, that all TCP's have been submitted to the ETR Safety Organization and that the submitted TCP's have ETR Safety approval prior to the performance of the test or operation.

f. Assurance of complete technical and idiomatic compatibility of S/V TCP's with appropriate L/V and S/C TCP's that are utilized in the performance of the S/V test or operation. Appropriate inputs from the Test Operations Office, Launch Vehicle Operations, and Spacecraft Operations will be incorporated into these S/V TCP's. Since S/V TCP's, by their nature, interface with other organizations and have most sequences common to those in other TCP's, initial development and subsequent changes must be coordinated with the affected organizations.

g. Establish and identify S/V NASA and contractor personnel which will coordinate the detailed S/V TCP preparation with appropriate Launch Vehicle, Spacecraft, and Technical Support personnel.

h. Release of approved S/V TCP's to appropriate NASA and contractor personnel not later than thirty (30) calendar days prior to the scheduled date of the test or operation.

6.1.2.4 KSC Safety Office

The KSC Safety Office is responsible for the following functions:

a. Providing review and signature approval of all L/V, S/C, and S/V TCP's and revisions thereto prior to publication; assuring that the operations are compatible with the applicable safety criteria; and utilizing safety personnel, techniques, and equipment as appropriate. Specific responsibilities and guidelines are established in the KSC Safety Office instruction, KMI 1710.13A, entitled "Safety Review of KSC Technical Operating Procedures."

b. Submitting all TCP's requiring approval of the Eastern Test Range (ETR), to the ETR Safety Office through appropriate organizational channels; and, upon approval by the ETR, notifying in writing the appropriate KSC organization. The KSC Safety Office will coordinate discussions pertaining to TCP approval between ETR Safety and the originating KSC organization.

7.1 INSTRUCTIONS

This directive establishes the management system for the preparation and management of TCP's to be utilized in the performance of L/V, S/C, and S/V tests and operations. The contents of the directive will be further amplified by additional detailed instructions prepared by the Director, Launch Vehicle Operations; the Director, Spacecraft Operations; and the Director of Launch Operations.

7.1.1 PREPARATION OF TCP's

7.1.1.1 General Guidelines

The general guidelines, specified below, will be followed in the preparation of L/V, S/C, and S/V TCP's:

a. Factory or test site TCP's, or appropriate sequences contained therein, which have been approved by MSFC or MSC, as appropriate, will be used as a baseline where applicable for the development of launch site TCP's. Wherever possible, factory or test site TCP s will be modified for use as KSC to fit unique facility requirements, safety considerations, S/V test requirements, and to meet objectives established in the Test and Checkout Plan.

b. For all tests involving hazardous operations, all TCP's will provide specific references to, or will contain written instructions for, the identification of emergency situations, safing of hardware, and implementation of emergency actions required to evacuate or safeguard personnel and to combat or limit the extent of damage should an emergency arise. For those tests identified as hazardous, appropriate notations, as specified in KMI 1710.13A entitled "Safety Review of KSC Technical Operating Procedures," will appear in the TCP's. Appropriate warning and caution notes will be conspicuously inserted within the TCP's preceding the execution of critical functions which could cause the development of hazardous conditions to personnel or equipment. In addition, hazardous TCP's will utilize the red KSC Form 23-352 as a cover and title page unless specific deviation is approved by the appropriate LVO, SCO, or DLO Test and Operations Management Offices. This form contains the note "THIS TCP CONTAINS HAZARDOUS OPERATIONS." For non-hazardous TCP's, the standard KSC Form 16-12 or other approved cover page will be used.

c. TCP's will define all operations or sequences that require KSC Safety Office personnel participation. TCP's will be standardized in regard to Quality Surveillance personnel participation and sign-off within the Directorates of Launch Operations, including associated contractors, during the execution of TCP's. TCP's and changes thereto will be provided to the above organizations, as appropriate, for review and required action in accordance with the provisions of this directive.

d. TCP's will have multiple effectivity where a high degree of hardware configuration stability exists.

e. "As-run" TCP's for tests and operations previously executed on the same vehicle or on previous vehicle will be utilized as the control baseline in the preparation of future TCP's to provide a system for traceability of TCP changes.

f. Preparatory operations to be performed prior to the start of a test or operation may be included as a prefix to the applicable TCP, or may be established in a separate subtask procedure or checklist. If established separately from the TCP, specific reference as a checkpoint will be made

within the TCP to assure satisfactory completion of the preparatory operations.

g. All approved L/V, S/C, and S/V TCP, will be released not later than thirty (30) calendar days prior to the scheduled date of the test or operation.

7.1.1.2 Time-Line

OICC's and TCP's will be prepared, reviewed, approved, and released not later than as specified in the time-line established below. All times are expressed as calendar days prior to the schedule date of the test or operation.

ACTIVITIES	DAYS PRIOR TO TEST
For S/V Integrated Tests/Operations, approval of Operations Interface Control Chart	75
MSC submit approved Flight Crew Procedures to KSC for all tests involving flight crew participation	No later than 40
Release of approved L/V, S/C, and S/V TCP's; start revision period	30
Receipt of recommended changes to L/V, S/C, and/or S/V TCP's from MSFC and MSC	No later than 15
End L/V, S/C, and S/V TCP revision period except for changes specifically approved per Paragraph 7.1.1.3	7
For TCP's performed on ETR, verify ETR Safety per Approval of TCP through KSC Safety Office	7
Verify release of all approved TCP revisions to test team members; start L/V, S/C, and S/V TCP deviation period	2 (48 hrs.)

ACTIVITIES	DAYS PRIOR TO TEST
Pre-Test Briefing, as specified by LOD No. 7A	2 (approx.)
Verify close-out of all open items relative to the test, as specified by LOD No. 7A	Test Start

7.1.1.3 TCP Approval Authority

7.1.1.3.1 Approval authority for L/V and S/C TCP's and changes thereto will be determined and implemented by the Director, Launch Vehicle Operations, and the Director, Spacecraft Operations, respectively.

7.1.1.3.2 All S/V TCP's and changes thereto with the exception of the TCP's for the Countdown Demonstration Test (CDDT) and the Launch Countdown will be prepared and approved by the Test Planning Manager and will be concurred in by the Test Operations Manager or their designees. The S/V TCP's and changes thereto for the CDDT and the Launch Countdown will be prepared by the Test Planning Manager, concurred by the Test Operations Manager, and approved by the Director of Launch Operations.

7.1.1.3.3 All L/V, S/C, and S/V TCP's and revisions thereto will be reviewed and approved by the KSC Safety Office prior to publication.

7.1.1.3.4 Only those changes to L/V, S/C or S/V TCP's that are mandatory for the safety of personnel or hardware, or are mandatory because of late changes in hardware or software configuration will be approved during the last seven (7) calendar days prior to the scheduled start of a test or operation unless approved by the following organizational level for the tests indicated:

a. Launch Operations Manager:

1. Flight Readiness Test (FRT).

2. Countdown Demonstration Test (CDDT).

3. Launch Countdown.

b. Test Supervisor:

1. Altitude chamber tests in MSOB.

2. Spacecraft final integrated systems test in MSOB.

3. Spacecraft integrated test after erection on L/V prior to electrical mate.

4. L/V overall tests in VAB or on pad.

5. S/V overall tests and simulated flights in VAB or on pad.

6. L/V or S/C propellant loading on pad.

7. Ordnance installations in VAB or on pad.

7.1.1.3.5 For all other TCP's, the Director, Launch Vehicle Operations; the Director, Spacecraft Operations; and the Director of Launch Operations will designate the approval authority for TCP changes. For those TCP changes occurring during the last seven (7) calendar days prior to the scheduled start of a test or operation, a policy will be established by the above that will require review and approval of all such changes by at least the next higher level of management above the normal approving authority.

7.1.1.3.6 Waivers will be obtained from MSFC or MSC prior to final approval of any TCP revision that compromises their submitted Test and Checkout Requirements. When TCP deviations that compromise the Test and Checkout Requirements are approved, waivers will be obtained from MSFC or MSC prior to close-out of the test.

7.1.1.4 TCP Change Control

The TCP change control system described below will be established to maintain positive control of all TCP changes subsequent to distribution of approved TCP's to test team members. A system of TCP revisions and real time TCP deviations is described.

7.1.1.4.1 TCP Revisions

7.1.1.4.1.1 TCP revisions to L/V, S/C, and S/V TCP's will be prepared and processed in accordance with the system specified by the Director, Launch Vehicle Operations; the Director, Spacecraft Operations; and the Director of Launch Operations, respectively. This system will include the necessary provisions for KSC Safety Office review and approval of all TCP revisions prior to publication.

7.1.1.4.1.2 Prior to publication of a TCP revision, the originating organization will review all other interfacing procedures for compatibility with the revision and, if other procedures are affected, will coordinate with the appropriate organizations in the preparation of parallel TCP revisions, as required. Final approval for proposed TCP revisions will signify that coordination with interfacing organizations has been completed and all interfacing TCP's will be revised accordingly. Approved parallel TCP's will be released as near the same time as possible to maintain complete compatibility of the final procedures. If it is determined by the originating organization that the revision affects no other procedure, no further coordination will be required.

7.1.1.4.1.3 All TCP revisions for tests performed involving the ETR DRSCS will be submitted to ETR Safety by the KSC Safety Office. The originating organization will coordinate with the KSC Safety Office to verify ETR Safety approval before performance of the test or operation.

7.1.1.4.1.4 All approved TCP revisions will be provided to test team members at least forty-eight (48) hours prior to the scheduled start of the test or operation. All subsequent TCP changes will be accomplished by the initiation of TCP deviations. Waivers to this requirement will be approved only at the organizational level specified in Paragraphs 7.1.1.3.4 and 7.1.1.3.5 of this directive.

7.1.1.4.2 TCP Deviations

7.1.1.4.2.1 TCP deviations of L/V, S/C, and S/V TCP's will be validated and coordinated in accordance with the system specified by the Director, Launch Vehicle Operations; the

Director, Spacecraft Operations; and the Director of Launch Operations, respectively. All TCP deviations that could introduce hazardous operations into the test or operation will be approved by the KSC Safety Office.

7.1.1.4.2.2 Subsequent to completion of all tests and operations, the following action, relative to TCP deviations, will be accomplished by the appropriate organizations:

a. An analysis of TCP deviations will be performed for the purpose of reducing deviations in subsequent TCP's.

b. Deviations constituting permanent changes will be incorporated into the appropriate TCP's.

c. Deviations constituting temporary or one-time changes will not require incorporation into the appropriate TCP's.

7.1.1.5 Format Specifications

7.1.1.5.1 TCP Standard Format

A standardized TCP format (either KSC Forms 23-81 or a similar machine-printed form) will be utilized for the preparation of all L/V, S/C, and S/V TCP's by the appropriate responsible organizations.

7.1.1.5.2 TCP Revision Identification

a. TCP revisions will be issued in the form of page substitutions or complete document re-release, whichever is the most practical process to update the TCP. Successive revisions to a TCP will be identified with appropriate revision numbers as established by the LVO, SCO, and DLO Test and Operations Management Offices.

b. When a TCP document is revised by page substitutions, successive revisions will be identified by the use of tinted paper for the affected pages. When the complete document is re-released, white paper will be used. When practical (determined by reproduction resources) revised page colors will be as follows:

1st Revision ---------- Pink

2nd Revision ---------- Blue

3rd Revision ---------- Green

4th Revision ---------- Yellow

7.1.1.5.3 Communications Call Signs

A standard system of communications call signs will be established for use during the execution of TCP's. The Test Planning Office will be responsible for the preparation, revision, and control of the KSC Apollo/Skylab Call Sign Handbook (Control Number 630-23-0001) which will identify all communications symbol assignments. No call signs, except those contained in the above handbook or as specifically authorized by the Test Planning Office, will be utilized within test and operations documentation or on communications networks during the performance of tests and operations.

7.1.1.5.4 Operational Communication System Designations

Operational Communication System (OIS) channel assignments are established by the Test Planning Office and approved by the Test Operations Office. A numerical designation exists for Complex 39 operations, and the MSO Spacecraft ACE Control Rooms. The appropriate communication channel for the described item in a TCP will appear in the communication column adjacent to the item.

7.1.1.5.5 TCP Numbering

TCP numbers will be assigned in accordance with KMI .

7.1.2 EXECUTION OF TCP's

7.1.2.1 General Guidelines

The general guidelines specified below will be followed in the execution of L/V, S/C, and S/V TCP's.

a. Prior ot the initiation of all L/V, S/C, and S/V tests and operations, a Pre-Test Briefing and Open Item Review will be conducted by the L/V or S/C Test Conductor, the Test Supervisor, or their designees, as appropriate, in accordance with the provisions of Launch Operations Directive No. 7A entitled "Test Briefings and De-Briefings."

b. Initiation of non-hazardous tests or operations will be approved by the L/V or S/C Test Conductor or the Test Supervisor, as appropriate.

c. Initiation of any test involving a hazardous operation will be approved at the organization level specified in Paragraphs 7.1.1.3.4 and 7.1.1.3.5 of this directive.

d. The Director, Spacecraft Operations, or his designee will obtain MSC Resident Manager approval for initiation of any test involving flight crew participation.

e. Troubleshooting during the performance of a test will be under the control of the L/V or S/C Test Conductor or their designees, as appropriate, who will be responsible for assuring proper documentation of activities in accordance with the system specified by the Director, Launch Vehicle Operations, and the Director, Spacecraft Operations, respectively. Where practical, OIS communications circuits designated for troubleshooting will be utilized.

f. All TCP deviations incurred during the performance of a test will be validated and coordinated in accordance with Paragraph 7.1.1.4.2 of this directive.

g. Communications adequate to support emergency operations will be provided for all tests involving hazardous operations.

h. OTV Recording

The Directors of Launch Vehicle Operations and Spacecraft Operations, or their designated representatives, shall establish the requirements for OTV recording. Normally, OTV recordings will be required: (1) to retain engineering data that can be best obtained via TV, and (2) to provide documentation coverage of hazardous operations.

When OTV is required, the TCP will include call-outs to verify the readiness of recording support, the commands to begin and terminate recording, and the cameras to be recorded.

When it is assessed that a hazardous operation does not require continuous recording coverage of all OTV cameras observing the hardware (such as launch vehicle cryogenic tanking), the TCP will contain callouts which will verify the availability of OTV recorders and their operational readiness to record upon command in the event of abnormal or emergency conditions.

The requirements for OTV recording or standby operations during the performance of a TCP will be identified within the appropriate RD's, along with holding time of recordings before erasure or other specific disposition instructions of recorded OTV tapes.

i. OIS Recordings

OIS recordings will be made during hazardous tests, covering those operations of hazard potential. The recording of specific channels of OIS during specified test activities will be defined in the TCP and RD. Disposition of the tapes will be documented in appropriate RD's.

Recording of the composite RF signal of the OIS system will be routinely accomplished for all tests identified as hazardous. These OIS tapes will normally be retained for at least ten (10) days unless other disposition is requested by operational management personnel.

j. Flight crews will be integrated into the KSC test team and will utilize KSC TCP's when participating in flight hardware tests at the launch site. Flight crew participation in these tests will be under the control of the test team during the times of active participation, except that the flight crew may take any actions necessary for safety. TCP deficiencies encountered by the flight crew while participating in launch site tests will be documented in accordance with the established system utilized by the test team.

k. MSC flight control personnel will be integrated into the KSC test team for those tests in which the MCC is required to participate.

l. GSFC USB personnel will be integrated into the KSC test team for those tests in which the MILA USB Station is required to participate.

End of Directive.

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KSC LOD NO. 6B
Date: March 9, 1971

INSTRUCTIONS:

Remove Pages 1 and 2 and replace with revised corresponding Change 1 pages (pink) dated June 3, 1971.

KSC LOD NO. 6B
Date: March 9, 1971

INSTRUCTION:

Page 2, Item 2.1.1.f and Page 16, Item 7.1.1.5.4: This KMI is not yet released. It is an update of existing KOI 8635.2A dated April 15, 1967. When approved, a "pen and ink" change will be issued.